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THE PLACEMENT OF ENGINEERING AND TECHNOLOGY GRADUATES 1982

ENGINEERING MANPOWER COMMISSION
OF THE
AMERICAN ASSOCIATION OF ENGINEERING SOCIETIES, INC.

PLACEMENT of ENGINEERING and TECHNOLOGY GRADUATES

1982

A Report of An Annual Survey conducted by the ENGINEERING MANPOWER COMMISSION

A Commission of the Engineering Affairs Council
of the
American Association of Engineering Societies. Inc.
345 East 47th Street
New York, New York 10017

AMERICAN ASSOCIATION OF ENGINEERING SOCIETIES, INC.

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ACKNOWLEDGMENTS

The survey on which this report was based was conducted by Judith A. McCormick and Joyce A. Kostrinsky under the general supervision of Patrick J. Sheridan, Director of Manpower Activities. The compiled oata were processed by Arthur W. Gilmore, a consultant to EMC.

This report was written and prepared by Mr. Gilmore and Ms. McCormick. Overall direction for the conduct of the survey and the preparation of this report was provided by Louis Marturana, Chairman of the Placement Survey sub-committee of EMC.

We owe particular thanks to the many deans and placement officials who participated in the survey. Without their cooperation we would be unable to conduct this annual study.

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INTRODUCTION

This is a report of the twenty-third annual survey of the placement of engineering and technology graduates conducted by the Engineering Manpower Commission (EMC) of the American Association of Engineering Societies, Inc. (AAES). The results of the 1982 survey, which compiled data on 36,926 graduates of over 340 U.S. engineering and technology schools, show a reduction in demand for engineers and technicians and technologists compared to the results from last year's survey. (For a lisiting of participating institutions, please see the appendix.)

The survey seeks to ascertain the placement status of engineering and technology graduates as of the date of graduation, which varies from school to school. The data are gathered from deans and placement officers, are carefully checked for accuracy and completeness, and then are processed in a format to show statistically meaningful results. Respondents are asked to exclude evening students (presumed employed during the day) and foreign nationals (who are under visa limitations not to accept employment in the U.S.).

Major placement categories identified in the survey are "Newly Employed," "Returning to a Previous Job," and "Full-Time Graduate Study." Since the latter category is of particular importance to engineering college deans (in relation to graduate enrollments and as a future source of faculty staffing), the respondents have been asked to identify the graduate program selected as either "technical" or "non-technical."

In response to the needs of industry and academia, this year's survey has elicited more detailed information on the placement of graduates at all levels.

While there is no single measure of success in the placement of new graduates, certain indicators confirm that 1982 was a year in which the job demand for recent graduates in engineering and technology softened by comparison to the 1981 results. Starting salaries accepted by graduates continued to move upward at reduced rates, with average increases of 10.0% for bachelor of engineering graduates, while the Consumer Price Index (CPI) rose by 6.5% during the past year, down from 10.8% reported a year ago.[1]

The placement status of engineering graduates at each degree level is shown graphically in Figure 1, on page 2. With each placement category is shown the "delta change" in the reported value compared to last year. [Delta (Δ) is equal to the 1982 percentage less the 1981 percentage.]

The most notable changes occurred in the category of "Newly Employed," which dropped by seven and 10 percentage points for the bachelor's and master's degrees respectively, while the "No Offers or Plans" category increased by seven and three percentage points for the same degree levels.

Students about whom no information was known by the placement office were tabulated in "No Information Available," and were recorded to assure completeness of the data reported. However, these data were not used in computing the statistics. We have found in past surveys that the statistics tend to remain constant within a narrow range regardless of whether or not schools with a high proportion of "No Information Available" graduates were counted.

COMPARISON WITH OTHER FIELDS

The College Placement Council (CPC) has reported the number of hires made in four general fields of specialization—engineering, science and mathematics, business, and "non-technical." As indicated in Table 1, on page 3, the reported distribution of hires in 1982 shows that engineering graduates accounted for 37% of the hires at the bachelor's level, 24% at the master's level, and 38% at the doctorate level. This is in spite of the fact that engineering has by far the smallest percentages of graduates at all three degree levels.

Next year's engineering employment climate will continue to be influenced by political and economic decisions, not to mention continuing concern about inflation, the international balance of trade, and the stability of the world economy in general. Increased spending for defense, energy and other R & D programs should stimulate demand. Increasing enrollments in recent years, as recorded by the EMC annual surveys of enrollments in engineering and technology, make larger graduating classes a certainty for the next three or four years. However, this year many colleges of engineering were forced to place a cap on enrollments because of limitations of faculty and essential laboratory equipment.

SURVEY ON LOCATION OF GRADUATES

The competition for Ph.D graduates in engineering was very keen this year. This is evidenced by the fact that the average salary acceptance for all fields at the Ph.D. level reported in our survey was $35,292 per year (252 salaries reported). This is in contrast to the $20-26,000 paid to beginning assistant professors in many colleges of engineering.[2] At the bachelor's level the average salary acceptance in 1982 was $24,924.

Because of the increasingly serious problem of staffing teaching faculties, it was decided to continue a survey initiated last year to permit tracking the ultimate placement of graduates at all levels. The results of this survey are shown in Table 2, on page 3.

According to this year's survey, academia receives approximately 30% of the doctorate recipients, industry over 60%, and government roughly 12%.

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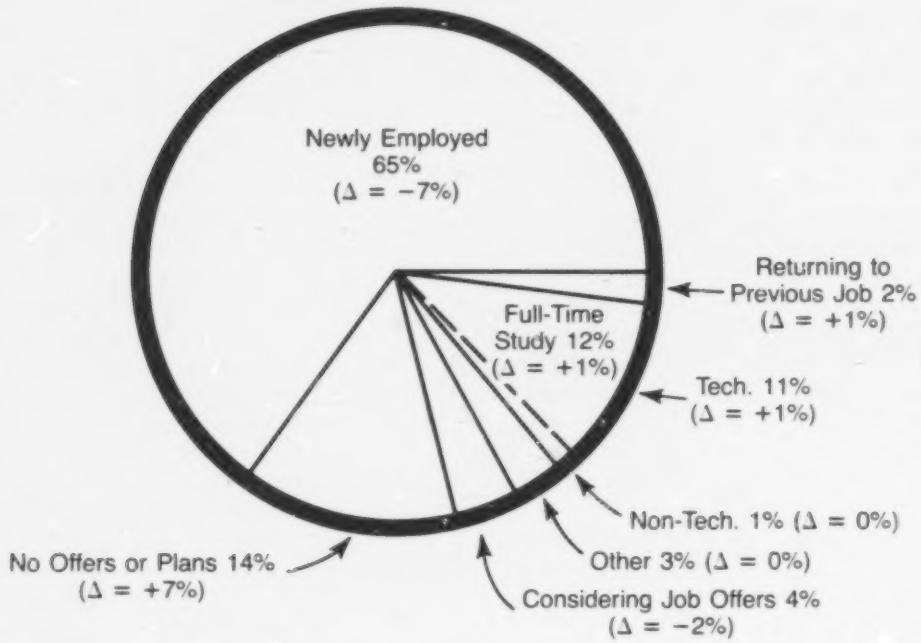
[1]Consumer Price Index for urban consumers based on 1967 = 100%. Data reported are for the change from July, 1981 to July, 1982.

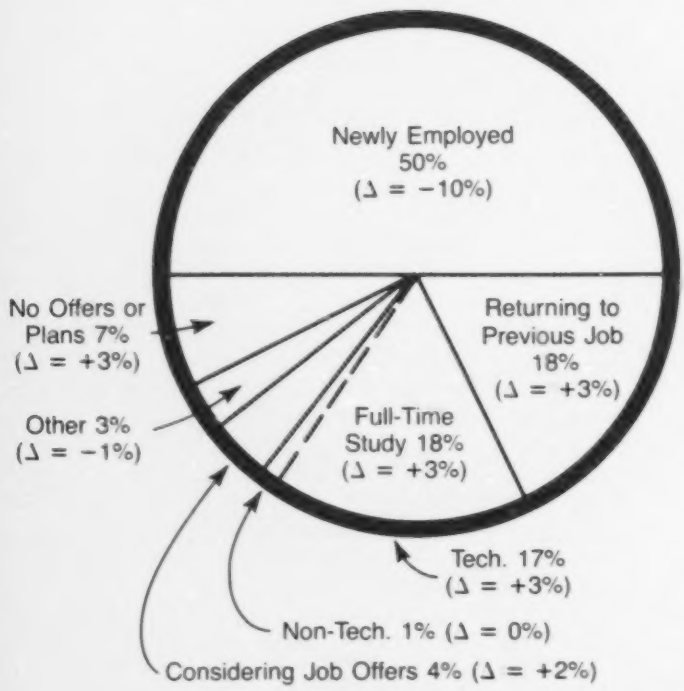
[2]From unpublished data from the EMC survey, "Salaries of Engineers in Education, 1982."

PLACEMENT OF ENGINEERING GRADUATES, 1982

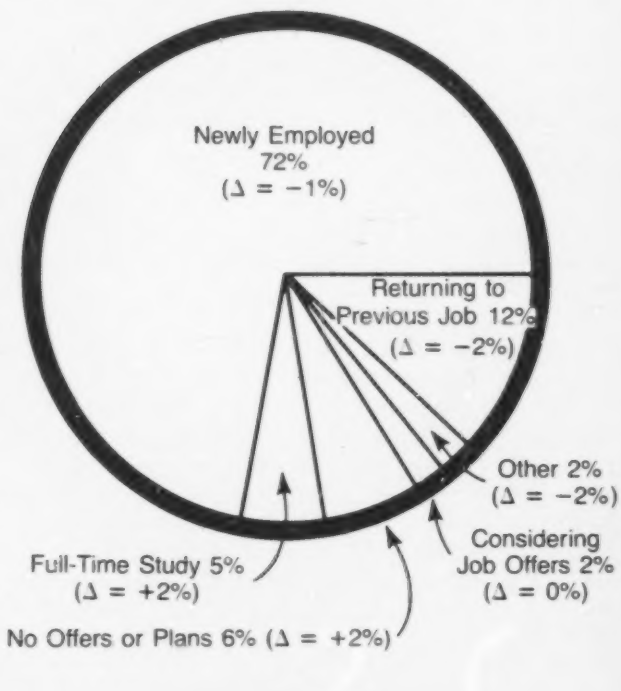
FIGURE 1



BACHELOR'S DEGREE



MASTER'S DEGREE



DOCTORATE DEGREE

TABLE 1

COMPARATIVE DISTRIBUTION OF COLLEGE GRADUATES VERSUS HIRES FOR SELECTED MAJOR FIELDS 1981-82 SCHOOL YEAR

	Bachelor's		Master's		Doctorate	
	% Degrees	% Hires	% Degrees	% Hires	% Degrees	% Hires
Engineering	6	35	4	23	7	34
Science & Math.	13	17	7	20	23	59
Business	16	41	15	54	3	4
Other Non-Technical	65	7	74	3	67	3

Sources: % Degrees estimated from *Projections of Education Statistics to 1986-87*, M.M. Frankel, ed., National Center for Education Statistics, Washington, 1978.

% Hires based on data shown in *Recruiting '83*, The College Placement Council, Inc.

TABLE 2

EMPLOYMENT DISTRIBUTION OF 1982 GRADUATES BY DEGREE LEVEL

	B.S.				M.S.				Ph.D.			
	Ind.	Govt.	Educ.	Total	Ind.	Govt.	Educ.	Total	Ind.	Govt.	Educ.	Total
Number Previously Employed	849	90	30	969	327	65	35	427	43	8	17	68
% Previously Employed	87.6	9.3	3.1	100	76.6	15.2	8.2	100	63.2	11.8	25	100
Number Newly Employed	5961	1017	84	7062	798	76	32	906	115	4	64	183
% Newly Employed	84.4	14.4	1.2	100	88.1	8.4	3.5	100	62.8	2.2	35.0	100

PLACEMENT AND STARTING SALARIES OF 1982 ENGINEERING GRADUATES

OVERALL PLACEMENT

The overall placement status of 1982 engineering graduates is shown in Table 3 (see page 8), which includes the numbers of graduates reported in each category, allowing comparison of the information for different degree levels. Notable are the increased percentages at all degree levels of graduates who elected to continue full-time graduate study. When compared to last year's data, the bachelors' figure is up by one percent, the masters' figure by three percent, and the doctorates' by 2% (see Figure 1, page 2). These changes are consistent with the sizeable reduction in the category of "Newly Employed" and the increases in "No Offers or Plans" noted in the case of bachelor's and master's degrees recipients.

OVERALL STARTING SALARIES

Starting salaries accepted by engineering graduates were obtained through this year's survey and are presented in Table 4, on page 8. As a basis for comparison, values of starting salary offers for the four most popular engineering disciplines, as compiled by CPC, are shown in Table 5, on page 9.

BACHELOR OF ENGINEERING GRADUATES

Trends in the placement of bachelor of engineering graduates over the past decade are shown in Table 6, on page 9. The effects of the sharp cuts in the defense and space programs during 1970-72, the recovery beginning in 1973, followed by the accelerating inflation and growing problems of environmental and energy control are readily apparent.

This year, the percentage of graduates without job offers or other plans increased to 14% from seven percent last year. The percentage employed decreased from 73% to 67% over the past year, and, as mentioned above, the percentage of students going on to full-time graduate study increased from 11% to 12%. The percentage of students mulling over job offers increased from three percent to four percent. (Variations of one or two percentage points in most of the categories can result from minor differences in survey coverage each year or even from rounding off the statistics, but over a span of years real trends are evident.)

Table 7, on page 10, gives the breakdown of placement by major curriculum. Among trends that have been relatively consistent over the past years is a tendency for graduates in the engineering sciences, general engineering, nuclear engineering, and "all other" engineering categories to continue on to advanced degrees. In this instance, Figure 1, on page 2, shows that the preference in graduate study is heavily oriented to the technical rather than non-technical programs (over 10-to-one in favor of technical).

Recently, ceramic engineering graduates have shown a preference for further study, but only 2% of the petroleum engineering graduates fell into this category, largely because of the exceptionally high starting salaries in this field (see Table 4, on page 8). During 1982, ceramic, agricultural, and mining engineering graduates had the highest percentage of graduates without job offers or plans (31%, 22%, and 22% respectively).

MASTER OF ENGINEERING GRADUATES

Placement at the master's degree level in 1982 is shown in Table 8, on page 11. The most significant change is a drop of 10 percentage points in the "Newly Employed" category. The categories showing increases consistent with this change were "Entering Full-Time Graduate Study" and "No Job Offers, Seeking Employment," both of which increased by three percentage points. In spite of these indications of softening demand, the average salary accepted by a master's degree recipient was just over $28,000 per year, as shown in Table 4, on page 8.

Referring to the breakdown by curriculum shown in Table 9, on page 11, it will be noted that engineering science is the weakest, with 15% in the "No Offers" category.

DOCTORATE DEGREE GRADUATES

Eighty-four percent of engineering doctorate degree recipients were employed, as contrasted with 67 percent at the bachelor's level and 68 percent at the master's degree level. Table 10, on page 12, shows how the placement situation for this group has varied over the years. Generally, doctorate graduates in engineering are new entrants in the job market, but this year 12 percent were returning to jobs previously held. Five percent of this year's doctorate candidates elected to engage in post-doctorate study.

In the various specialities, as shown in Table 11 on page 12, engineering science has the highest percentage (31%) in the unplaced category. It should be noted, however, that the doctorate statistics are based on small numbers of graduates in most instances, and percentages should be viewed with caution. Overall, the placement experience for doctorate engineering graduates since 1973 has been very good in contrast to experiences of Ph.D. holders in non-technical fields. National statistics (including those shown in Table 2, on page 3) indicate that over half of all doctorate engineers are employed in industry, while in most other fields, academic employment is predominant.

Salaries accepted by doctorate degree graduates continued their upward trend, as shown in Table 4, on page 8. The overall average annual salary acceptance for 1982 was $35,290, up 11.4% from the 1981 level.

TABLE 3

PLACEMENT OF 1982 ENGINEERING GRADUATES BY DEGREE

	B.S.		M.S.		Ph.D.	
	No.	%	No.	%	No.	%
Accepted Job Offer	15,466	65	1,639	50	366	72
Returning to a Previous Job	456	2	588	18	61	12
Entering Full-Time Study	2,922	12	573	18	25	5
Other Plans	788	3	99	3	11	2
Considering Job Offers	1,012	4	146	4	12	2
No Job Offers, Seeking Employment	3,210	14	237	7	32	6
Total With Status Known	**23,853**	**100**	**3,282**	**100**	**507**	**100**
No Information	8,477	—	1,473	—	425	—
Total Reported	32,330	—	4,755	—	932	—

TABLE 4

MEAN MONTHLY STARTING SALARIES *ACCEPTED* BY 1982 ENGINEERING GRADUATES

	B.S.	M.S.	Ph.D.
Aerospace	$1,864	$2,231	$3,300
Agricultural	1,922	—	—
Architectural	1,783	—	—
Ceramic	2,137	—	—
Chemical	2,215	2,382	3,006
Civil	1,914	2,183	2,645
Computer	1,968	2,367	3,190
Electrical & Electronic	2,058	2,369	2,991
Mechanical	2,097	2,302	2,885
Metallurgical	2,092	2,445	2,756
Mining & Geological	2,197	2,463	2,945
Nuclear	2,106	2,335	2,769
Marine	1,988	2,000	—
Petroleum	2,578	2,655	3,208
Overall	**2,077**	**2,335**	**2,941**
Total No. of Salaries Reported	17,098	1,923	252

TABLE 5

MEAN MONTHLY STARTING SALARIES *OFFERED* TO 1982 ENGINEERING GRADUATES

	B.S.	M.S.	Ph.D.
Chemical	$2,256	$2,459	$3,019
Civil	1,925	2,249	2,851
Electrical	2,064	2,369	3,099
Mechanical	2,098	2,332	2,959

Source: *CPC Salary Survey Formal Report No. 3, July 1982,* College Placement Council, PA, 1982.

TABLE 6

PLACEMENT OF BACHELOR OF ENGINEERING GRADUATES 1972-1982

	Employed*	Entering Full-Time Graduate Study	Entering Military Service**	Other Plans	Considering Job Offers	No Job Offers, Seeking Employment
1972	54%	20%	9%	2%	5%	11%
1973	62	19	5	3	6	5
1974	67	17	4	2	4	6
1975	58	19	4	2	3	12
1976	58	18	3	3	3	14
1977	69	16	**	4	3	8
1978	75	13	**	4	3	5
1979	76	12	**	3	3	3
1980	75	12	**	5	6	5
1981	73	11	**	3	3	7
1982	**67**	**12**	**	**3**	**4**	**14**

*Includes "Accepted Job Offers" and "Returning to a Previous Job."
**Combined with "Other Plans" starting in 1977.

TABLE 7

PLACEMENT OF BACHELOR OF ENGINEERING GRADUATES BY CURRICULUM, 1982

	Accepted Job Offer	Returning to a Previous Job	Entering Full-Time Graduate Study	Other Plans	Considering Job Offers	No Job Offers, Seeking Employment	Number With Status Known
Aerospace	57%	6%	14%	6%	5%	14%	503
Agricultural	46	0	21	6	5	22	220
Architectural	73	3	4	4	1	14	139
Ceramic	42	1	23	1	1	31	140
Chemical	58	1	15	3	4	20	2,787
Civil	54	2	13	6	5	20	3,001
Computer	69	2	12	2	5	10	871
Electrical & Electronic	71	2	11	3	4	9	5,714
Engineering Science	64	2	17	4	5	8	635
General	40	5	31	3	4	18	253
Industrial	69	1	8	3	3	15	1,207
Materials Sci. & Eng.	49	3	30	1	5	13	148
Mechanical	71	2	9	3	5	11	5,252
Metallurgical	62	1	17	2	4	14	406
Mining & Geological	63	1	8	5	1	22	722
Nuclear	55	1	27	7	1	9	154
Petroleum	88	0	2	1	6	4	511
Systems	64	5	9	3	6	14	226
Other	56	1	23	2	4	14	816
Overall	**65**	**2**	**12**	**3**	**4**	**14**	**23,853**

TABLE 8

PLACEMENT OF MASTER OF ENGINEERING GRADUATES 1972-1982

	Newly Employed	Returning to a Previous Job	Entering Full-Time Graduate Study	Entering Military Service*	Other Plans	Considering Job Offers	No Job Offers, Seeking Employment
1972	38%	25%	19%	7%	4%	3%	4%
1973	45	17	22	7	6	2	2
1974	49	18	18	4	7	1	3
1975	52	13	18	2	7	1	7
1976	42	17	20	2	8	2	9
1977	58	18	15	*	3	1	4
1978	56	21	15	*	3	2	3
1979	59	16	15	*	3	4	3
1980	61	12	18	*	5	2	2
1981	60	15	15	*	3	2	4
1982	**50**	**18**	**18**	*	**3**	**4**	**7**

*Combined with "Other Plans" starting in 1977.

TABLE 9

PLACEMENT OF MASTER OF ENGINEERING GRADUATES BY CURRICULUM, 1982

	Accepted Job Offer	Returning to a Previous Job	Entering Full-Time Graduate Study	Other Plans	Considering Job Offers	No Job Offers, Seeking Employment	Number With Status Known
Aerospace	20%	58%	18%	0%	0%	3%	72
Agricultural	63	5	16	5	5	5	19
Chemical	56	8	22	5	4	6	255
Civil	52	15	16	3	4	11	529
Computer	55	22	12	2	6	3	215
Electrical & Electronic	51	20	17	2	5	5	718
Engineering Science	36	24	17	2	6	15	53
Industrial	57	15	14	4	3	8	178
Materials Sci. & Eng.	42	4	25	5	16	7	55
Mechanical	51	20	12	3	6	8	470
Metallurgical	56	14	24	0	2	4	50
Mining & Geological	67	5	17	5	3	3	75
Nuclear	47	19	19	3	8	4	97
Systems	50	30	15	1	1	3	93
Other	34	19	31	4	3	9	332
Overall	**50**	**18**	**18**	**3**	**4**	**7**	**3,282**

TABLE 10

PLACEMENT OF DOCTORATE DEGREE GRADUATES 1973-1982

	Newly Employed	Returning to a Previous Job	Entering Full-Time Graduate Study	Entering Military Service*	Other Plans	Considering Job Offers	No Job Offers, Seeking Employment
1973	69%	11%	2%	3%	11%	3%	2%
1974	66	15	3	1	10	2	2
1975	69	12	2	2	6	1	8
1976	65	11	3	2	10	1	8
1977	75	13	3	*	3	1	4
1978	73	8	6	*	1	2	10
1979	79	9	3	*	3	3	3
1980	80	12	0	*	3	3	2
1981	73	14	3	*	4	2	4
1982	**72**	**12**	**5**	*	**2**	**2**	**6**

*Combined with "Other Plans" starting in 1977.

TABLE 11

PLACEMENT OF DOCTORATE ENGINEERING GRADUATES BY CURRICULUM, 1982

	Accepted Job Offer	Returning to a Previous Job	Post-Doctorate Study	Other Plans	Considering Job Offers	No Job Offers, Seeking Employment	Number With Status Known
Chemical	88%	3%	5%	0%	0%	5%	64
Civil	69	15	0	3	3	10	39
Computer	80	12	4	0	4	0	25
Electrical & Electronic	82	9	2	0	2	4	81
Engineering Science	56	0	0	12	0	31	16
General	44	50	0	0	6	0	16
Industrial	50	25	0	0	12	12	8
Materials Sci. & Eng.*	90	10	0	0	0	0	20
Mechanical	79	8	0	2	4	8	53
Metallurgical	84	10	5	0	0	0	19
Mining & Geological	69	25	0	0	0	6	16
Nuclear	68	13	0	3	3	13	31
Other	56	5	21	6	3	9	77
Systems	69	23	0	0	8	0	13
Overall	**72**	**12**	**5**	**2**	**2**	**6**	**507**

*Includes ceramic engineering

PLACEMENT AND STARTING SALARIES OF 1982 TECHNOLOGY GRADUATES

OVERALL PLACEMENT

The placement status of technology graduates at the associate degree level and at the bachelor's degree level are shown in Figure 2, on page 16. In the case of associate degree recipients, a continuing reduction occurred in those newly employed and those returning to a previous job (from 55% in 1981 to 52% in 1982). This was accompanied by a decrease in the number going on to full-time study and a sizeable increase in the "No Offers" category (13% to 20%). In the case of the bachelor of technology graduates, a similar reduction in those employed (76% in 1981 to 71% in 1982) is accompanied by the increment in those with "No Offers" (from 11% in 1981 to 19% in 1982).

BACHELOR OF TECHNOLOGY GRADUATES

Overall, bachelor of technology graduates were about as successful in finding jobs this year as were the graduates of engineering programs. Table 12, on page 17, shows how they have fared over the years. While one can see many parallels with the trend in engineering, the most notable difference is the small number of technologists pursuing graduate study, which increased slightly this year (from three percent to four percent).

Table 13, on page 18, which represents the data broken down by curriculum group, shows that technologists are more likely than engineers to have jobs to which they are returning upon graduation (nine percent vs. two percent). On the other hand, the number of technologists with no offers was also larger (19% vs. 14%). In most other respects, placement differences between the various curriculum groups are minor.

The EMC salary data reported in Table 14, on page 19, indicate an overall average starting salary for 1982 bachelor of technology graduates of $1,876 per month, which was about $201 less than the average for engineers, but up by 12.2% over last year. This represents a premium of about 10.7% for the engineering degree.

ASSOCIATE DEGREE TECHNOLOGY GRADUATES

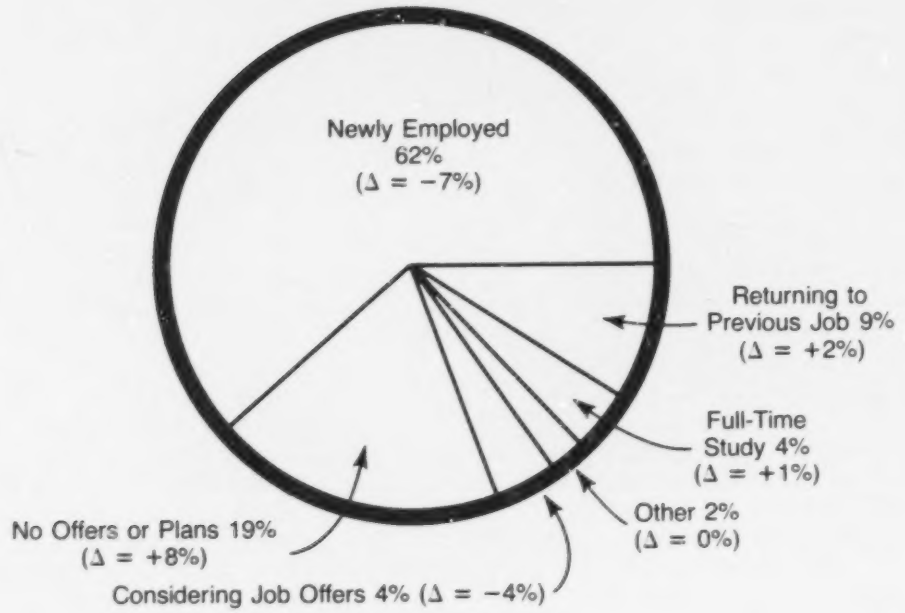
Table 15, on page 19, illustrates the change in placement status of associate degree technicians since 1972. From 1981 to 1982 the proportion going on to full-time study decreased three percentage points, while the percentage employed fell by four points. The number without job offers or other plans increased seven percent.

Table 16, on page 20, gives the breakdown by curriculum for technology graduates. Here it is seen that advanced study is favored heavily by certain curricula, most notably architectural, electrical, automotive, and mechanical technology. Nuclear, chemical, and air conditioning technology had the largest percentages of graduates without job offers. In the employed category, aerospace technology showed the largest proportion of graduates returning to jobs previously held.

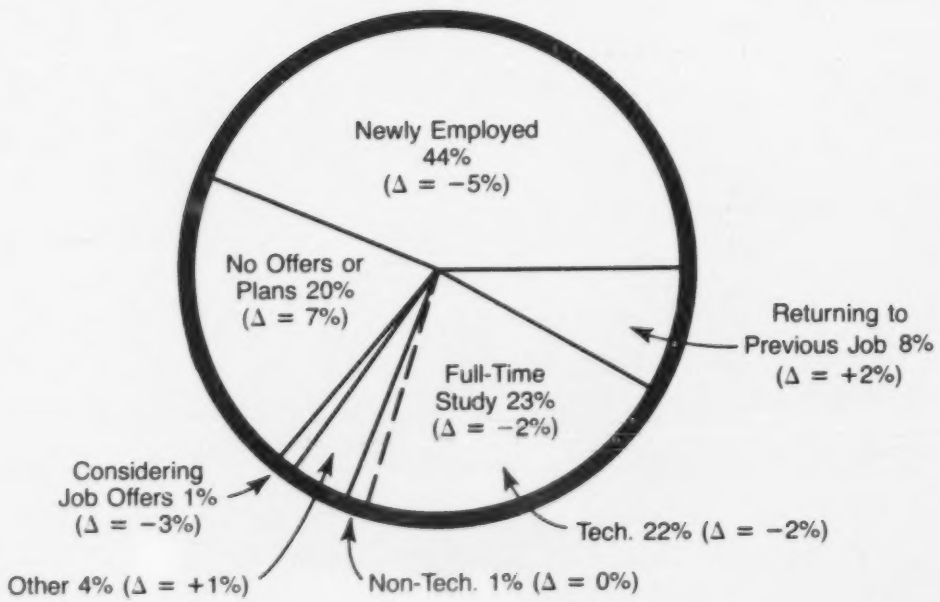
Starting salary statistics for associate degree graduates are given in Table 14 on page 19. As will be noted, the overall mean at the associate degree level is $576 less per month than at the bachelor's degree level.

PLACEMENT OF TECHNOLOGY GRADUATES, 1982

FIGURE 2



BACHELOR'S DEGREE



ASSOCIATE DEGREE

TABLE 12

PLACEMENT OF BACHELOR OF TECHNOLOGY GRADUATES
1972-1982

	Employed*	Entering Full-Time Graduate Study	Entering Military Service**	Other Plans	Considering Job Offers	No Job Offers, Seeking Employment
1972	67%	5%	7%	2%	12%	7%
1973	76	3	5	4	8	4
1974	75	4	3	3	5	11
1975	66	4	4	4	7	16
1976	74	6	2	4	5	10
1977	77	6	**	2	5	11
1978	82	2	**	2	4	10
1979	80	3	**	2	9	7
1980	82	3	**	1	5	9
1981	76	3	**	2	8	11
1982	**71**	**4**	**	**2**	**4**	**19**

*Includes "Accepted Job Offers" and "Returning to a Previous Job."
**Combined with "Other Plans" starting in 1977.

TABLE 13

PLACEMENT OF BACHELOR OF TECHNOLOGY GRADUATES BY CURRICULUM, 1982

	Accepted Job Offer	Returning to a Previous Job	Entering Full-Time Graduate Study	Other Plans	Considering Job Offers	No Job Offers, Seeking Employment	Number With Status Known
Air Cond. Tech.	56%	—	6%	—	6%	31%	16
Architectural	45	3	16	—	3	32	62
Automotive Eng. Tech.	48	—	21	—	6	24	33
Civil	62	5	7	3	5	18	185
Computer	47	13	8	1	3	28	136
Drafting & Design Tech.	58	6	6	15	2	12	48
Electrical	66	4	1	—	5	23	467
Electronic	67	13	4	3	4	10	672
Industrial	40	12	6	4	7	30	186
Manufacturing	72	2	6	—	4	16	101
Mechanical	59	11	3	1	4	23	558
Other	66	10	2	2	4	17	400
Overall	**62**	**9**	**4**	**2**	**4**	**19**	**2,908**

TABLE 14

MEAN MONTHLY STARTING SALARIES ACCEPTED BY 1982 TECHNOLOGY GRADUATES

	B.S.	A.S.
Air Conditioning	$1,902	$1,467
Architectural	1,554	1,014
Automotive Engineering Tech.	1,697	1,109
Chemical Engineering Tech.	2,031	1,333
Civil	1,685	1,119
Computer	1,836	1,225
Drafting & Design Tech.	1,545	1,222
Electrical	1,956	1,362
Electronic	1,846	1,350
Industrial	1,925	1,426
Manufacturing	1,910	1,315
Mechanical	1,938	1,376
Other	1,885	1,364
Overall	**1,876**	**1,300**

TABLE 15

PLACEMENT OF ASSOCIATE OF TECHNOLOGY GRADUATES 1972-1982

	Employed*	Continuing Full-Time Study	Entering Military Service**	Other Plans	Considering Job Offers	No Job Offers, Seeking Employment
1972	58%	24%	3%	2%	9%	4%
1973	61	25	1	1	7	5
1974	67	18	2	1	6	6
1975	59	23	1	1	4	11
1976	58	24	1	1	6	10
1977	64	17	**	5	4	10
1978	65	20	**	5	3	7
1979	63	20	**	4	6	7
1980	61	19	**	4	5	10
1981	55	25	**	3	4	13
1982	**51**	**22**	**	**4**	**1**	**20**

*Includes "Accepted Job Offers" and "Returning to a Previous Job."
**Combined with "Other Plans" starting in 1977.

TABLE 16

PLACEMENT OF ASSOCIATE OF TECHNOLOGY GRADUATES BY CURRICULUM, 1982

	Accepted Job Offer	Returning to a Previous Job	Continuing Full-Time Study	Other Plans	Considering Job Offers	No Job Offers, Seeking Employment	Number With Status Known
Aerospace	38%	24%	13%	4%	0%	22%	79
Air Conditioning	59	0	12	3	0	28	83
Architectural	36	14	24	3	2	21	414
Automotive Eng. Tech.	44	4	27	2	2	20	187
Chemical Eng. Tech.	53	1	10	4	-	33	144
Civil	38	10	23	6	2	20	395
Computer	39	7	23	8	4	20	692
Drafting & Design Tech.	56	3	12	2	2	25	376
Electrical	38	6	30	2	4	20	832
Electronic	55	7	15	5	2	17	1,455
Industrial	40	19	12	3	0	26	149
Manufacturing	46	17	18	2	0	17	95
Mechanical	41	7	30	1	1	18	790
Nuclear	40	4	0	0	8	48	25
Other	33	9	31	5	2	20	660
Overall	**44**	**8**	**22**	**4**	**1**	**20**	**6,376**

PLACEMENT OF WOMEN AND MINORITY ENGINEERING AND TECHNOLOGY GRADUATES

For the sixth year, the Engineering Manpower Commission asked for placement data on minority members and women in the graduating classes. The results were encouraging in that useable information was reported on 2,900 graduates from the five special groups in question. Table 17 gives the placement statistics for the bachelor's degree graduates in engineering only, since this group had the largest number of students reported.

As a general conclusion, the survey results support the impression generally held among engineering educators and employers that women and minority members are in strong demand. On the other hand, the data do not indicate extreme favoritism toward these groups, since the proportions without job offers or other plans are reasonably close to the average for all engineering graduates.

Persons closely associated with programs aimed at increasing the representation of women and minorities in engineering have frequently pointed out that each of these groups must be considered individually because of its distinctive characteristics and special needs. The placement data are summarized below for each of the groups.

WOMEN

Compared with all engineering graduates at the bachelor's level (as shown in Figure 1, on page 2), higher percentages were in the employed categories (either having accepted a job or returning to one previously held). These findings are consistent with the higher salaries paid to women engineering graduates.

BLACKS

Table 17 shows that Blacks at the bachelor's level had a higher than average percentage of employment as demonstrated in Figure 1 on page 2. A significantly larger than average percentage of Blacks are returning to jobs previously held. In contrast, a smaller number are continuing full-time study.

HISPANICS

Bachelor's degree graduates from this minority group had a higher than average percentage employed. The percentage going on to full-time study was somewhat less than the average at the B.S. level.

ASIAN/PACIFIC ISLANDERS

The most outstanding feature of this group is the high proportion of engineering graduates going on to further full-time study. This finding is consistent with past degree and enrollment statistics for Asian/Pacific Islanders. Few Asian/Pacific Islanders were reported from the technology schools in either associate or bachelor's degree programs.

AMERICAN INDIANS

The numbers of graduates from this minority group were too small to provide useful statistics except possibly at the bachelor of engineering level. Virtually all graduates were either newly employed or going on to full-time study, but with only 17 bachelor's degree recipients reported, no conclusions should be drawn.

TABLE 17

PLACEMENT OF WOMEN AND MINORITY BACHELOR OF ENGINEERING GRADUATES 1982

	Accepted Job Offer	Returning to a Previous Job	Entering Full-Time Graduate Study	Other Plans	Considering Job Offers	No Job Offers, Seeking Employment	Number With Status Known
Women	69%	1%	13%	3%	3%	12%	2,033
Blacks	78	2	8	0	3	9	374
Hispanics	76	1	6	3	4	10	153
Asian/Pacific Islanders	67	2	11	3	3	14	323
American Indians	82	0	12	0	0	6	17

APPENDIX

PATICIPANTS IN THE 1982 PLACEMENT SURVEY
Alphabetical by State

Engineering Schools

ALABAMA
Auburn University
Tuskegee Institute
University of Alabama
University of Southern Alabama

ALASKA
University of Alaska

ARIZONA
University of Arizona

ARKANSAS
Arkansas State University
John Brown University
University of Arkansas

CALIFORNIA
California Institute of Technology
California Polytechnic State University
California State Polytechnic Institute
California State University—Chico
California State University—Fullerton
California State University—Los Angeles
California State University—Northridge
Harvey Mudd College
San Jose State University
United States Naval Post Grad.
University of California—Davis
University of California—Los Angeles
University of California—Santa Barbara
University of the Pacific
University of Redlands

COLORADO
Colorado School of Mines
Colorado State University
United States Air Force Academy
University of Colorado

CONNECTICUT
U.S. Coast Guard Academy
University of Connecticut
University of Hartford
Yale University

DELAWARE
University of Delaware

DISTRICT OF COLUMBIA
George Washington University
Howard University
University of District of Columbia

FLORIDA
Embry-Riddle Aero University
Florida Atlantic University
Florida Institute of Technology
University of Central Florida
University of Florida
University of Miami
University of Southern Florida

GEORGIA
Georgia Institute of Technology

HAWAII
University of Hawaii

IDAHO
Idaho State University
University of Idaho

ILLINOIS
Northwestern Tech.
Northwestern University
Parks College of St. Louis University
Southern Illinois University
University of Illinois—Urbana-Champaign

INDIANA
Purdue University—Calumet
Purdue University—Indianapolis
Purdue University—West Lafayette
Rose-Hulman Inst. of Tech.
Tri-State University
University of Evansville
Valparaiso University

IOWA
Iowa State University
University of Iowa

KANSAS
Kansas State University
University of Kansas
Wichita State University

KENTUCKY
University of Kentucky
University of Louisville

LOUISIANA
Louisiana State University
Louisiana Technical University
McNeese State University
Tulane University
University of Southwestern Louisiana

MAINE
Maine Maritime Academy

MARYLAND
Loyola College

MASSACHUSETTS
Boston University
Harvard University
Massachusetts Maritime Academy
Southeastern Massachusetts University
University of Lowell
Western New England College
Worcester Polytechnical Institute

MICHIGAN
Detroit Inst. of Tech.
General Motors Inst.
Michigan State University
Michigan Technical University
Oakland University
University of Michigan—College of Engineering
University of Michigan—Dearborn
Wayne State University

MISSISSIPPI
Mississippi State University
University of Mississippi

MISSOURI
University of Missouri—Columbia
University of Missouri—Rolla
Washington University

MONTANA
Montana College of Mineral Science & Technology

NEBRASKA
University of Nebraska

NEVADA
University of Nevada

NEW HAMPSHIRE
Dartmouth College
University of New Hampshire

NEW JERSEY
New Jersey Institute of Technology
Rutgers University
Stevens Institute

NEW MEXICO
New Mexico Institute of Technology & Mining
New Mexico State University

NEW YORK
CCNY
Clarkson College
Columbia University
Cooper Union
Cornell University
Polytechnic Institute of New York
Rensselaer Poly Institute
Rochester Institute of Technology
SUNY College of Ceramics at Alfred
SUNY Environmental Science and Forestry
SUNY Maritime College
Syracuse University
Union College
University of Rochester

NORTH CAROLINA
North Carolina A & T State University
North Carolina State University
University of North Carolina at Chapel Hill
University of North Carolina at Charlotte

NORTH DAKOTA
University of North Dakota

OHIO
Air Force Inst. of Technology
Case Western Reserve
Marietta College
Ohio Northern University
Ohio State University
University of Akron
Wright State University
Youngstown State University

OKLAHOMA
Oklahoma State University
University of Oklahoma
University of Tulsa

OREGON
Portland State University

PENNSYLVANIA
Bucknell University
Carnegie-Mellon University
Gannon University
Geneva College

Lafayette College
Lehigh University
Lincoln University
Pennsylvania State University
Swarthmore College
University of Pittsburg
Villanova University
Widener College
Wilkes College

RHODE ISLAND
Brown University
Providence College
University of Rhode Island

SOUTH CAROLINA
Clemson University
University of South Carolina

SOUTH DAKOTA
South Dakota School of Mines and Technology
South Dakota State University

TENNESSEE
Memphis State University
Tennessee State University
University of Tennessee—Chattanooga
University of Tennessee Space Institute
Vanderbilt University

TEXAS
Lamar University
Rice University
St. Mary's University
Texas A & I University
Texas Tech. University
Trinity University
University of Houston
University of Texas, Arlington
University of Texas, Austin
University of Texas, El Paso
University of Texas, Permian Basin

UTAH
Brigham Young University
University of Utah
Utah State University

VERMONT
Norwich University
University of Vermont

VIRGINIA
Hampton Institute
Old Dominion University
University of Virginia School of Engineering & Applied Science
Virginia Military Institute
Virginia Polytechnic Institute and State University
Washington and Lee University

WASHINGTON
Gonzaga University
Seattle University
Walla Walla College
Washington State University

WEST VIRGINIA
West Virginia Graduate
West Virginia Institute of Technology

WISCONSIN
Institute of Paper Chemistry
Marquette University
Milwaukee School of Engineering
University of Wisconsin—Madison

Technology Schools

ARIZONA
De Vry Institute of Technology
Phoenix College

ARKANSAS
Southern Arkansas University
University of Arkansas

CALIFORNIA
California Martime Academy
California State Polytechnic University

COLORADO
Colorado Tech. College
Trinidad State Junior College
University of Southern Colorado

CONNECTICUT
Central Connecticut State College
Norwalk State Technical College
Thames Valley State Technical College
Waterbury State Tech.

DISTRICT OF COLUMBIA
University of District of Columbia

FLORIDA
Brevard College
Florida Keys Community College
Hillsborough Community College
Lake Sumpter Community College
Miami Dade Community College—South Campus
St. Petersburg Junior College
University of Central Florida
University of North Florida
University of South Florida

GEORGIA
Abraham Baldwin Agricultural College
DeVry Institute of Technology
Savannah State College
Southern Technical Institute
South Georgia College

ILLINOIS
Bradley University
College of Dupage
DeVry Institute of Technology
Joliet Junior College
Morrison Institute of Technology
Parkland College
Richland Community College
Rock Valley College
Southern Illinois University—Carbondale

INDIANA
Indiana State University
Purdue University—Indianapolis
Purdue University—West Lafayette

IOWA
Hawkeye Institute of Technology
North Iowa Area Community College

KANSAS
Kansas State University
Kansas Technical Institute
Pittsburgh State University
Schweiter Technical School

KENTUCKY
University of Lousville—Speed Scientific School

LOUISIANA
Louisiana Technical University
Southern University

MASSACHUSETTS
Capitol Institute of Technology
Prince George Community College
Greenfield Community College
Northeastern University
Springfield Tech. Community College
Wentworth Institute of Technology

MICHIGAN
Alpena Community College
Delta College
Lawrence Inst. of Tech.
Michigan Technological University
Northwestern Michigan College
Wayne State University

MINNESOTA
Anoka-Ramsey Community College
St. Cloud State University

MISSISSIPPI
Copiah Lincoln Junior College
Jackson State University
Mississippi State University
Southwest State University
University of Southern Mississippi

MISSOURI
Missouri Institute of Technology
St. Louis Community College

NEW HAMPSHIRE
New Hampshire Technical Institute

NEW JERSEY
Atlantic Community College
County College of Morris
Middlesex County College
New Jersey Institute of Technology
Union College

NEW MEXICO
New Mexico State University

NEW YORK
Academy of Aeronautics
Broome Community College
Corning Community College
Erie Comminity College
Jefferson Community College
Mohawk Valley Community College
NYC Technical College
Orange County Community College
Rochester Institute of Technology
SUNY A & T at Alfred
SUNY A & T at Cobleskill
SUNY A & T at Morrisville
SUNY at Canton
SUNY College of Technology at Utica/Rome
Technical Careers Institute

NORTH CAROLINA
Cape Fear Technical Institute
Central Carolina Tech. Inst.
Central Piedmont Community College
Gaston College
Lake Region Junior College
University of North Carolina—Charlotte
Western Carolina University
Wilkes Community College

OHIO
Kent State University
Muskingum Area Tech. College
Ohio Inst. of Technology
Owens Technical College
University of Akron

University of Cincinnati
University of Dayton
Youngstown State University

OREGON
Blue Mountain Community College
Oregon Institute of Technology
Oregon State University
Portland Community College

PENNSYLVANIA
Gannon University
Harrisburg Area Community College
Pennsylvania Tech.
Temple University
Williamsport Area Community College

RHODE ISLAND
Rhode Island Junior College
Roger Williams College

SOUTH CAROLINA
Aiken Technical College
Clemson University
Denmark Tech.
Francis Marion College
Greenvale Tech. College
Midlands Tech. College
Trident Tech. College

TENNESSEE
Austin Peay State University
Cleveland State Community College
East Tennessee State University
Knoxville State Tech. Institute
Memphis State University
Nashville State Tech.
Tennessee Technical University
Walters State Community College

TEXAS
Bee County College
DeVry Inst. of Tech.
Texas A & M University
Texas State Technical Institute
Texas Tech University
University of Houston

UTAH
Thomas Nelson Community College
Weber State College

VERMONT
Norwich University
Vermont Technical College

VIRGINIA
John Tyler Community College
Lord Fairfax Community College
Old Dominion University
Southside Virginia Community College
Southwest Virginia Community College
Wyethville Community College

WEST VIRGINIA
Bluefield State College
West Virginia Institute of Technology

WISCONSIN
Lakeshore Tech. Inst.
Milwaukee School of Engineering

AAES

MEMBER SOCIETIES

American Society of Civil Engineers	1852
American Institute of Mining, Metallurgical and Petroleum Engineers, Inc.	1871
The American Society of Mechanical Engineers	1880
The Institute of Electrical & Electronics Engineers	1884
American Society for Engineering Education	1893
American Society of Heating, Refrigerating & Air-Conditioning Engineers, Inc.	1894
American Society of Agricultural Engineers	1907
American Institute of Chemical Engineers	1908
American Society for Metals	1913
National Council of Engineering Examiners	1920
Society of Manufacturing Engineers	1932
American Institute of Aeronautics and Astronautics	1932
National Society of Professional Engineers	1934
National Institute of Ceramic Engineers	1938
Society of Allied Weight Engineers, Inc.	1939
Society of Plastics Engineers, Inc.	1941
American Society for Quality Control	1946
Standards Engineering Society	1947
American Institute of Industrial Engineers, Inc.	1948
Society of Women Engineers	1950
Society of Fire Protection Engineers	1950
American Institute of Plant Engineers	1954
American Nuclear Society	1954
American Academy of Environmental Engineers	1955
American Association of Cost Engineers	1956
System Safety Society	1962
Association of Energy Engineers	1977
American Indian Science & Engineering Society	1977

ASSOCIATE SOCIETIES

The Tau Beta Pi Association, Inc.	1885
Air Pollution Control Association	1907
American Council of Independent Laboratories, Inc.	1937
American Congress on Surveying & Mapping	1941
National Association of Corrosion Engineers	1945
Federation of Materials Societies	1972
National Action Council for Minorities in Engineering, Inc.	1980

REGIONAL SOCIETIES

Western Society of Engineers	1869
The Cleveland Engineering Society	1880
Engineering Society of Detroit	1895
Washington Society of Engineers	1905
Colorado Society of Engineers	1916
Colorado Engineering Council	1919
Engineering Societies of New England, Inc.	1923
Quad-Cities Engineering and Science Council	1969

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